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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/718,990	11/21/2003	Rong-Chang Liang	07783.0013.NPUS00	9111

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EXAMINER	
HON, SOW FUN	

ART UNIT	PAPER NUMBER
1772	

DATE MAILED: 12/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/718,990	LIANG ET AL.	
	Examiner	Art Unit	
	Sow-Fun Hon	1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18,50 and 51* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18,50 and 51* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/30/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/30/05 has been entered.

Withdrawn Rejections

2. The objection, 35 U.S.C. 112, 2nd paragraph, 102(b) and 103(a) rejections have been withdrawn due to Applicant's amendment dated 9/30/05.

New Rejections

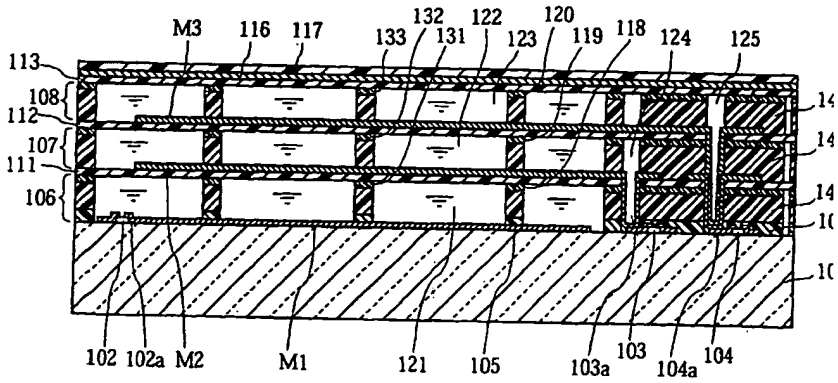
Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

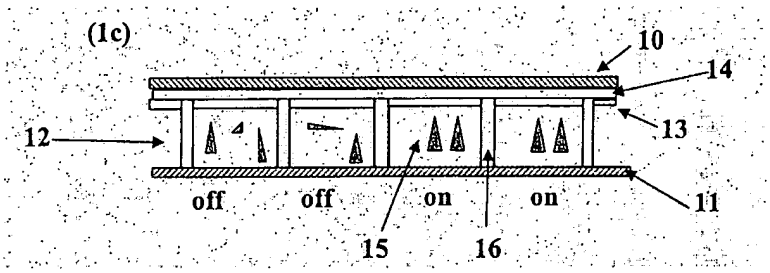
3. Claims 1-12, 14-17, 50-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamanaka (US 6,304,309) in view of Thomas (US 4,798,849).

Regarding claim 1, Yamanaka teaches a liquid crystal display comprising display cells such as 121-123 (abstract figure), as shown on the next page. Yamanaka teaches that the display cells are gaps between supporting members, which are filled with liquid

crystal (column 34, lines 31-35) wherein each gap has a square side of 25 microns (distance between adjacent supporting members, column 38, lines 8-10), forming



microcups as defined by Applicant's specification (drawing (1c)) as shown below.



Yamanaka teaches that the microcup composition (resin film and supporting members) comprises a thermoplastic, a thermoset or a precursor thereof (material exerting thermoplastic characteristics at a higher temperature, or subjected to a hardening treatment, column 39, lines 61-67 column 40, lines 1-5). Yamanaka fails to teach that the microcup composition further comprises a first liquid crystal composition aside from the second liquid crystal composition filling the microcups (gaps between supporting members, which are filled with liquid crystal, column 34, lines 31-35).

However, Thomas teaches a composition comprising a thermoplastic, a thermoset and a liquid crystal composition (column 2, lines 62-64). Thomas teaches that a sufficient amount of liquid crystal composition can be dissolved or dispersed into

the bulk polymer to provide property or processing improvement (column 10, lines 49-55), whereby significant and unexpected improvements are made in the physical properties of the bulk polymer (column 2, lines 55-60), without major losses in other properties (column 2, lines 6-11).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have incorporated a first liquid crystal composition as part of the microcup composition of Yamanaka, in order to obtain a microcup composition with the desired physical strength and processibility, as taught by Thomas.

Regarding claim 2, Yamanaka teaches that the microcup composition is thermoplastic at a higher temperature (material exerting thermoplastic characteristics at a higher temperature, or subjected to a hardening treatment, column 39, lines 61-67 column 40, lines 1-5). Therefore the microcup composition is an embossable composition due to its thermoplastic characteristics.

Regarding claim 3, Yamanaka fails to teach a first liquid crystal composition as part of the microcup composition.

However, Thomas teaches that the liquid crystal in the first liquid crystal composition has a concentration no greater than its solubility limit in the bulk polymer (a sufficient amount of liquid crystal composition can be dissolved into the bulk polymer to provide property or processing improvement (column 10, lines 49-55), whereby significant and unexpected improvements are made in the physical properties of the bulk polymer (column 2, lines 55-60), without major losses in other properties (column 2, lines 6-11).

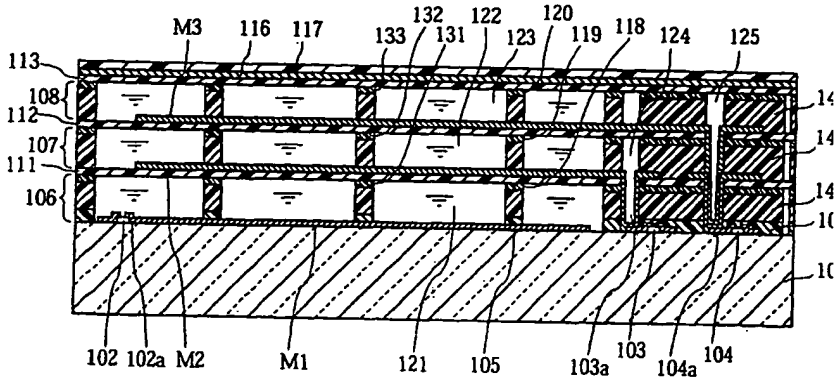
Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have incorporated a first liquid crystal composition as part of the microcup composition of Yamanaka, wherein the liquid crystal in the first liquid crystal composition has a concentration no greater than its solubility limit in the microcup composition, in order to obtain a microcup composition with the desired physical strength and processibility, as taught by Thomas.

Regarding claim 4, Yamanaka fails to teach that the thermoplastic, thermoset or precursor thereof is an epoxide.

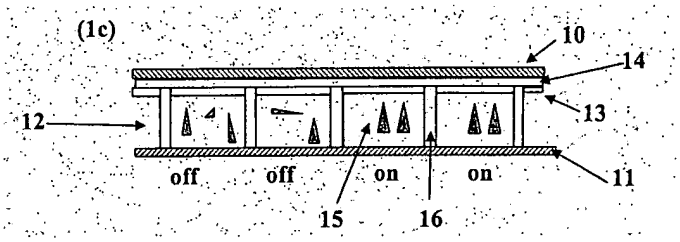
However, Thomas teaches that the thermoset is an epoxide (epoxy resin, column 3, lines 30-31), which is notoriously well known in the art.

Therefore, it would have been obvious to one of ordinary skill at the time the invention was made, to have used an epoxide as the thermoset in the microcup composition of Yamanaka, in order to utilize the physical properties of the epoxide, as taught by Thomas.

Regarding claims 5, 7-8, Yamanaka teaches a liquid crystal display comprising display cells such as 121-123 (abstract figure), as shown on the next page. Yamanaka teaches that the display cells are gaps between supporting members, which are filled with a liquid crystal composition (column 34, lines 31-35) and sealed with a sealing layer (resin film 111, column 34, lines 31-34) wherein each gap has a square side of 25 microns (distance between adjacent supporting members, column 38, lines 8-10),



forming microcups as defined by Applicant's specification (drawing (1c)) as shown below.



Yamanaka teaches that the microcup composition (resin film and supporting members) comprises a thermoplastic, a thermoset or a precursor thereof (material exerting thermoplastic characteristics at a higher temperature, or subjected to a hardening treatment, column 39, lines 61-67 column 40, lines 1-5). Yamanaka fails to teach that the microcup composition further comprises a speed enhancing comonomer or oligomer.

However, Thomas teaches a composition comprising a thermoplastic, a thermoset (column 2, lines 62-64) and a monomer or oligomer which comprises a poly(ethylene glycol) or poly(propylene glycol) moiety (column 10, lines 3-10), and is a speed enhancing monomer or oligomer as defined by Applicant's specification (page 12, paragraph [0052]). Thomas teaches that the monomer or oligomer comprising a

poly(ethylene glycol) or poly(propylene glycol) moiety, is dissolved or dispersed into the bulk polymer to provide property or processing improvement (column 10, lines 49-55). Furthermore, Thomas teaches that the poly(ethylene glycol) or polypropylene glycol) moiety is reacted with a secondary monomer such as a monomethacrylate or a monoacrylate (polyether reacted with hydroxyethylemethacrylate and hydroxyethylacrylate, column 10, lines 17-22).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have added the monomer or oligomer comprising poly(ethylene glycol) or poly(propylene glycol) moeity, or poly(ethylene glycol) or poly(propylene glycol) monoacrylate or monomethacrylate moiety, which is a speed enhancing monomer or oligomer, as defined by Applicant, to the microcup composition of Yamanaka, in order to provide property or processing improvement, as taught by Thomas.

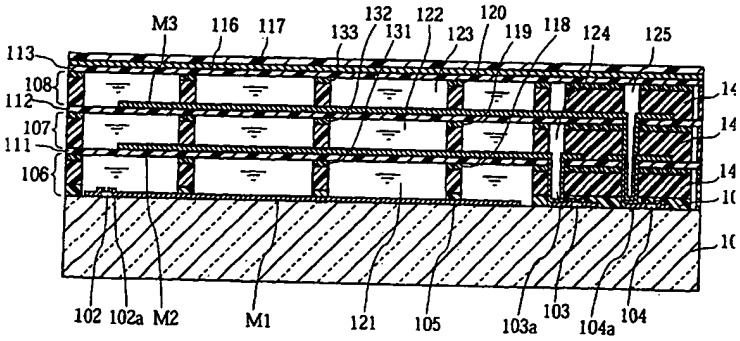
Regarding claim 6, Yamanaka teaches that the microcup composition is thermoplastic at a higher temperature (material exerting thermoplastic characteristics at a higher temperature, or subjected to a hardening treatment, column 39, lines 61-67 column 40, lines 1-5). Therefore the microcup composition is an embossable composition due to its thermoplastic characteristics.

Regarding claim 9, Yamanaka fails to teach that the thermoplastic, thermoset or precursor thereof is an epoxide.

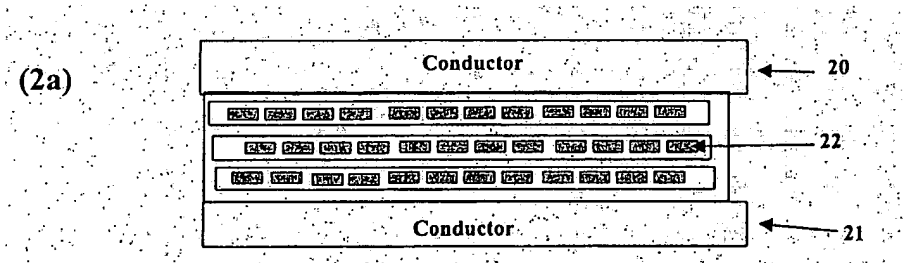
However, Thomas teaches that the thermoset is an epoxide (epoxy resin, column 3, lines 30-31), which is notoriously well known in the art.

Therefore, it would have been obvious to one of ordinary skill at the time the invention was made, to have used an epoxide as the thermoset in the microcup composition of Yamanaka, in order to utilize the physical properties of the epoxide, as taught by Thomas.

Regarding claim 10, Yamanaka teaches a liquid crystal display comprising display cells such as 121-123 (abstract figure), as shown below. Yamanaka teaches that the display cells are gaps between supporting members, which are filled with liquid crystal (column 34, lines 31-35) wherein each gap has a square side of 25 microns (distance between adjacent supporting members, column 38, lines 8-10),



forming two or more layers of microcups as defined by Applicant's specification (drawing (2a)) as shown below.



Yamanaka teaches that the microcup composition (resin film and supporting members) comprises a thermoplastic, a thermoset or a precursor thereof (material exerting thermoplastic characteristics at a higher temperature, or subjected to a

hardening treatment, column 39, lines 61-67 column 40, lines 1-5). Yamanaka fails to teach that the microcup composition further comprises liquid crystals aside from the liquid crystal filling the microcups (gaps between supporting members, which are filled with liquid crystal, column 34, lines 31-35).

However, Thomas teaches a composition comprising a thermoplastic, a thermoset and liquid crystal (column 2, lines 62-64). Thomas teaches that a sufficient amount of liquid crystal can be dissolved or dispersed into the bulk polymer to provide property or processing improvement (column 10, lines 49-55), whereby significant and unexpected improvements are made in the physical properties of the bulk polymer (column 2, lines 55-60), without major losses in other properties (column 2, lines 6-11).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have incorporated liquid crystals as part of the microcup composition of Yamanaka, in order to obtain a microcup composition with the desired physical strength and processibility, as taught by Thomas.

Regarding claim 11, Yamanaka fails to teach liquid crystals as part of the microcup composition.

However, Thomas teaches that the liquid crystal in the composition has a concentration no greater than its solubility limit in the bulk polymer (a sufficient amount of liquid crystal composition can be dissolved into the bulk polymer to provide property or processing improvement (column 10, lines 49-55), whereby significant and unexpected improvements are made in the physical properties of the bulk polymer (column 2, lines 55-60), without major losses in other properties (column 2, lines 6-11).

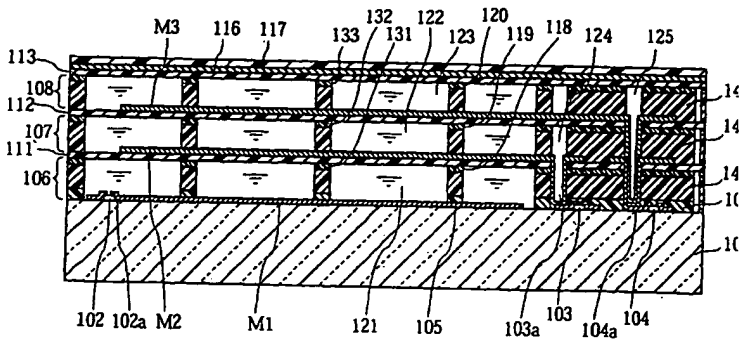
Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have incorporated liquid crystals as part of the microcup composition of Yamanaka, wherein the liquid crystal has a concentration no greater than its solubility limit in the microcup composition, in order to obtain a microcup composition with the desired physical strength and processibility, as taught by Thomas.

Regarding claim 12, Yamanaka fails to teach that the thermoplastic, thermoset or precursor thereof is an epoxide.

However, Thomas teaches that the thermoset is an epoxide (epoxy resin, column 3, lines 30-31), which is notoriously well known in the art.

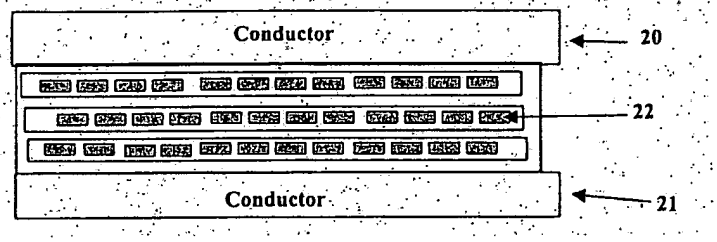
Therefore, it would have been obvious to one of ordinary skill at the time the invention was made, to have used an epoxide as the thermoset in the microcup composition of Yamanaka, in order to utilize the physical properties of the epoxide, as taught by Thomas.

Regarding claim 14, Yamanaka teaches a liquid crystal display comprising display cells such as 121-123 (abstract figure), as shown on the next page. Yamanaka teaches that the display cells are gaps between supporting members, which are filled with liquid crystal (column 34, lines 31-35) wherein each gap has a square side of 25 microns (distance between adjacent supporting members, column 38, lines 8-10),



forming two or more layers of microcups as defined by Applicant's specification (drawing (2a)) as shown below.

(2a)



Regarding claims 14-16, Yamanaka teaches that the microcup composition (resin film and supporting members) comprises a thermoplastic, a thermoset or a precursor thereof (material exerting thermoplastic characteristics at a higher temperature, or subjected to a hardening treatment, column 39, lines 61-67 column 40, lines 1-5). Yamanaka fails to teach that the microcup composition further comprises a speed enhancing comonomer or oligomer.

However, Thomas teaches a composition comprising a thermoplastic, a thermoset (column 2, lines 62-64) and a monomer or oligomer which comprises a poly(ethylene glycol) or poly(propylene glycol) moiety (column 10, lines 3-10), and is a speed enhancing monomer or oligomer as defined by Applicant's specification (page 12, paragraph [0052]). Thomas teaches that the monomer or oligomer comprising a

poly(ethylene glycol) or poly(propylene glycol) moiety, is dissolved or dispersed into the bulk polymer to provide property or processing improvement (column 10, lines 49-55). Furthermore, Thomas teaches that the poly(ethylene glycol) or polypropylene glycol) moiety is reacted with a secondary monomer such as a monomethacrylate or a monoacrylate (polyether reacted with hydroxyethylemethacrylate and hydroxyethylacrylate, column 10, lines 17-22).

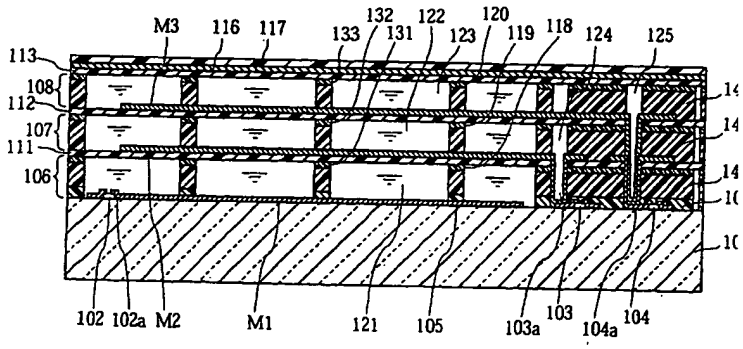
Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have added the monomer or oligomer comprising poly(ethylene glycol) or poly(propylene glycol) moeity, or poly(ethylene glycol) or poly(propylene glycol) monoacrylate or monomethacrylate moiety, which is a speed enhancing monomer or oligomer, as defined by Applicant, to the microcup composition of Yamanaka, in order to provide property or processing improvement, as taught by Thomas.

Regarding claim 17, Yamanaka fails to teach that the thermoplastic, thermoset or precursor thereof is an epoxide.

However, Thomas teaches that the thermoset is an epoxide (epoxy resin, column 3, lines 30-31), which is notoriously well known in the art.

Therefore, it would have been obvious to one of ordinary skill at the time the invention was made, to have used an epoxide as the thermoset in the microcup composition of Yamanaka, in order to utilize the physical properties of the epoxide, as taught by Thomas.

Regarding claims 50-51, Yamanaka teaches that the two or more layers of microcups are sandwiched between two conductor films M3 and M1 shown in the figure of Yamanaka below (pixel electrode M3, column 35, lines 22-23; pixel electrode M1, column 34, lines 1-2; figure, abstract).

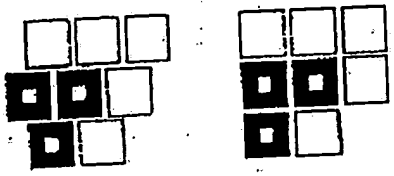


4. Claims 13,18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamanaka in view of Thomas as applied to claims 1-12, 14-17, 50-51 above, and further in view of Schmidt (CA 2340683).

Yamanaka in view of Thomas teaches a liquid crystal display comprising two or more layers of microcups as display cells, wherein said microcups are formed from a microcup composition comprising a thermoplastic, a thermoset or a precursor thereof, and liquid crystals, or a speed enhancing comonomer or oligomer. Yamanaka in view of Thomas fails to teach that the two or more layers of microcups are arranged in a staggered manner.

However, Schmidt teaches an electrophoretic display wherein the microcups (cavities in the microcompartment film) are arranged in rows and columns, which can be staggered as well as on top of each other (inclined arrangement, page 6, lines 5-15), as illustrated in Fig. 2 of Schmidt on the next page.

Fig. 2



Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have staggered the arrangement of two or more layers of microcups taught by Schmidt, in the liquid crystal display of Yamanaka in view of Thomas, in order to obtain a liquid crystal display with the desired display properties provided by the staggered arrangement, as taught by Schmidt.

Response to Arguments

5. Applicant's arguments with respect to claims 1-18, 50-51 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached on (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. Hon.

Sow-Fun Hon

12/05/05

William P. Watkins III

WILLIAM P. WATKINS III
PRIMARY EXAMINER